## *What Is Claimed Is:*

1. An impulse radio receiver, comprising:

a time base that provides a periodic timing signal;

a precision timing generator that uses said periodic timing signal to produce a timing trigger signal;

a template generator that uses said timing trigger signal to produce a template signal;

a delay to receive said template signal and output a delayed template signal;

a first correlator that correlates a received impulse radio signal with said template signal to produce a first correlator output signal;

a second correlator that correlates said received impulse radio signal with said delayed template signal to produce a second correlator output signal;

a data detector that receives at least said first correlator output signal and produces a data signal; and

a time base adjustor that receives at least said second correlator output signal and produces a time base adjustment signal that is used to synchronize at least one of said time base and said precision timing generator with said received impulse radio signal.

2. The impulse radio receiver of claim 1, wherein said received impulse radio signal is flip modulated.

3. The impulse radio receiver of claim 2, wherein said received impulse radio signal consists of first type pulses and second type pulses that are substantially the inverse of said first type pulses.

4. The impulse radio receiver of claim 1, wherein said first correlator, said second correlator and said data detector perform demodulation of said flip modulated received impulse radio signal.

5. The impulse radio receiver of claim 1, wherein said data detector comprises:

a data path signal selector/inverter that receives said first correlator output signal and outputs a first data state signal corresponding to a first data state and a second data state signal corresponding to a second data state; and

a maximum value selector that determines which of said first data state signal and said second data state signal is greater and produces said data signal based on said determination.

6. The impulse radio receiver of claim 1, wherein said data detector comprises:

a data path signal selector/inverter that receives said first correlator output signal and outputs a plurality of first data state signals corresponding to a first data state and a plurality of second data state signals corresponding to a second data state;

a first accumulator that adds said plurality of first data state signals and outputs a first data state sum;

a second accumulator that adds said plurality of second data state signals and outputs a second data state sum;

a maximum value selector that determines which of said first data state sum and said second state data state sum is greater and produces said data signal based on said determination.

7. The impulse radio receiver of claim 1, wherein said time base adjustor comprises:

a lock path signal selector/inverter that receives said second correlator output signal and outputs a first timing adjustment increment and a second timing adjustment increment; and

an output selector that receives said data signal, said first timing adjustment increment, and said second timing adjustment increment, and determines whether said timing adjustment signal should comprise said first timing adjustment increment or said second timing adjustment increment.

8. The impulse radio receiver of claim 1, wherein said time base adjustor comprises:

a lock path signal selector/inverter that receives said second correlator output signal and outputs a plurality of first timing adjustment increments and a plurality of second timing adjustment increments;

a first accumulator that adds said plurality of first timing adjustment increments and outputs a first timing adjustment sum;

a second accumulator that adds said plurality of second timing adjustment increments and outputs a second timing adjustment sum; and

an output selector that receives said data signal, said first timing adjustment sum, and said second timing adjustment sum, and determines whether said timing adjustment signal should comprise said first timing adjustment sum or said second timing adjustment sum.

9. The impulse radio receiver of claim 1, wherein said data detector also receives said second correlator output signal, and wherein said data detector produces said data signal based on said first data output signal and said second data output signal.

10. The impulse radio receiver of claim 9, wherein said time base adjustor also receivers said first correlator output signal, and wherein said time base adjustor produces said time base adjustment signal based on said first correlator output signal, said second correlator output signal, and said data signal.

11. The impulse radio receiver of claim 10, wherein said received impulse radio signal is flip and shift modulated.

12. The impulse radio receiver of claim 11, wherein said received impulse radio signal consists of first pulses, second pulses that are the inverse of said first pulses, delayed first pulses, and delayed second pulses that are the inverse of said delayed first pulses.

13. The impulse radio receiver of claim 1, further comprising a code generator to output a code signal, and

wherein said precision timing generator receives said code signal and produces said template signal based on at least said code signal and said timing trigger signal, and

wherein said received signal is coded using a transmit code signal equivalent to said code signal.

14. An impulse radio receiver, comprising:

a time base to output a periodic timing signal;

a precision timing generator that uses said periodic timing signal to produce a timing trigger signal;

a template generator that uses said timing trigger signal to produce a template signal;

a delay to receive said template signal and output a delayed template signal;

a first correlator that correlates a received impulse radio signal with said template signal to produce a first correlator output signal;

a second correlator that correlates said received impulse radio signal with said delayed template signal to produce a second correlator output signal;

a data detector that produces a data signal based on said first correlator output signal and said second correlator output signal; and

a time base adjustor that produces a time base adjustment signal based on said data signal, said first correlator output signal and said second correlator output signal, wherein said time base adjustment signal is used to synchronize at least one of said time base and said precision timing generator with said received impulse radio signal.

15. The impulse radio receiver of claim 14, wherein said received impulse radio signal is flip and shift modulated.

16. The impulse radio receiver of claim 15, wherein said received impulse radio signal consists of first type pulses, second type pulses that are substantially the inverse of said first pulses, delayed first type pulses, and delayed second type pulses that are substantially the inverse of said delayed first type pulses.

17. The impulse radio receiver of claim 14, wherein said data detector comprises:

a data path signal selector/inverter that receives said first correlator output signal and said second correlator output signal and outputs a first data state signal corresponding to a first data state, a second data state signal corresponding to a second data state, a third data state signal corresponding to a third data state, and a forth data state signal corresponding to a fourth data state; and

a maximum value selector that determines which of said first data state signal, said second data state signal, said third data state signal, and said forth data state signal is greatest and produces said data signal based on said determination.

18. The impulse radio receiver of claim 14, wherein said data detector comprises:

a data path signal selector/inverter that receives said first correlator output signal and said second correlator output signal and outputs a plurality of first data state signals corresponding to a first data state, a plurality of second data state signals corresponding to a second data state, a plurality of third data state signals

corresponding to a third data state, and a plurality of forth data state signals corresponding to a fourth data state;

a first accumulator that adds said plurality of first data state signals and outputs a first data state sum;

a second accumulator that adds said plurality of second data state signals and outputs a second data state sum;

a third accumulator that adds said plurality of third data state signals and outputs a third data state sum;

a forth accumulator that adds said plurality of forth data state signals and outputs a forth data state sum; and

a maximum value selector that determines which of said first data state sum, said second state data state sum, said third data state sum, and said forth data state sum is greatest, and produces said data signal based on said determination.

19. The impulse radio receiver of claim 14, wherein said time base adjustor comprises:

a lock path signal selector/inverter that receives said first correlator output signal and said second correlator output signal and outputs a first timing adjustment increment, a second timing adjustment increment, a third timing signal adjustment increment, and forth timing adjustment increment; and

an output selector that receives said data signal, said first timing adjustment increment, said second timing adjustment increment, said third timing adjustment increment and said forth timing adjustment increment, and determines whether said timing adjustment signal should comprise said first timing adjustment increment, said second timing adjustment increment, said third timing adjustment increment, or said forth timing adjustment increment.

20. The impulse radio receiver of claim 14, wherein said time base adjustor comprises:

a lock path signal selector/inverter that receive said first correlator output signal and said second correlator output signal and outputs a plurality of first

timing adjustment increments, a plurality of second timing adjustment increments, a plurality of third timing adjustment increments and a plurality of forth timing adjustment increments;

a first accumulator that adds said plurality of first timing adjustment increments and outputs a first timing adjustment sum;

a second accumulator that adds said plurality of second timing adjustment increments and outputs a second timing adjustment sum;

a third accumulator that adds said plurality of third timing adjustment increments and outputs a third timing adjustment sum;

a forth accumulator that adds said plurality of forth timing adjustment increments and outputs a forth timing adjustment sum; and

an output selector that receives said data signal, said first timing adjustment sum, said second timing adjustment sum, said third timing adjustment sum and said forth timing adjustment sum, and determines whether said timing adjustment signal should comprise said first timing adjustment sum, said second timing adjustment sum, said third timing adjustment sum or said forth timing adjustment sum.

21. The impulse radio receiver of claim 14, further comprising a code generator to output a code signal, and

wherein said precision timing generator receives said code signal and produces said template signal based said coding signal and said timing trigger signal, and

wherein said received signal is coded using a transmit code signal equivalent to said code signal.

22. A method for receiving an impulse radio signal, comprising the steps of:

a. receiving a periodic timing signal;

b. using said periodic timing signal to produce a timing trigger signal;

c. producing a template signal using said timing trigger signal;

d. producing a delayed output signal using said template signal;

e. correlating a received impulse radio signal with said template signal to produce a first correlator output signal;

f. correlating said received impulse radio signal with said delayed template signal to produce a second correlator output signal;

g. producing a data signal based on at least said first correlator output signal;

h. producing a time base adjustment signal based on said second correlator output signal; and

i. using said time base adjustment signal to synchronize at least one of said periodic timing signal and said timing trigger signal with said received impulse radio signal.

23. The method of claim 22, wherein said received impulse radio signal is flip modulated.

24. The method of claim 23, wherein said received impulse radio signal consists of first type pulses and second type pulses that are substantially the inverse of said first pulses.

25. The method of claim 22 wherein step g. comprises:

(i) producing, based on said first correlator output, a first data state signal corresponding to a first data state and a second data state signal corresponding to a second data state; and

(ii) determining which of said first data state signal and said second data state signal is greater.

26. The method of claim 22, wherein step g. comprises:

(i) producing, based on said first correlator output, a plurality of first data state signals corresponding to a first data state and a plurality of second data state signals corresponding to a second data state;

(ii) adding said plurality of first data state signals to produce a first data state sum;

(iii) adding said plurality of second data state signals to produce a second data state sum; and

(iv) determining which of said first data state sum and said second data state sum is greater.

27. The method of claim 22, wherein step h. comprises:

(i) producing, based on said second correlator output signal, a first timing adjustment increment and a second timing adjustment increment; and

(ii) determining whether said timing adjustment signal should comprise said first timing adjustment increment or said second timing adjustment increment.

28. The method of claim 22, wherein step h. comprises:

(i) producing, based on said second correlator output signal, a plurality of first timing adjustment increments and a plurality of second timing adjustment increments;

(ii) adding said plurality of first timing adjustment increments to produce a first timing adjustment sum;

(iii) adding said plurality of second timing adjustment increments to produce a second timing adjustment sum; and

(iv) determining whether said timing adjustment signal should comprise said first timing adjustment sum or said second timing adjustment sum.

29. The method of claim 22, wherein step g. comprises producing said data signal based on said first correlator output signal and said second correlator output signal.

30. The method of claim 29, wherein step h. comprises producing said time base adjustment signal based on said second correlator output signal and said first correlator output signal.

31. The method of claim 30, wherein said received impulse radio signal is flip and shift modulated.

32. The method of claim 31, wherein said received impulse radio signal consists of first type pulses, second type pulses that are substantially the inverse of said first type pulses, delayed first type pulses, and delayed second type pulses that are substantially the inverse of said delayed first type pulses.

33. The method of claim 22, wherein step b. comprises producing said template signal using said timing trigger signal and a code signal, wherein said received signal is coded using a transmit code signal equivalent to said code signal.

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34. A method of receiving an impulse radio signal, comprising the steps of:

a. receiving a periodic timing signal;

b. producing a timing trigger signal using at least said periodic timing signal;

c. producing a template signal using said timing trigger signal;

e. producing a delayed template signal using said timing trigger signal;

f. producing a first correlator output signal by correlating a received impulse radio signal with said template signal;

g. producing a second correlator output signal by correlating said received impulse radio signal with said delayed template signal;

h. producing a data signal based on said first correlator output signal and said second correlator output signal;

i. producing a time base adjustment signal based on said data signal, said first correlator output signal and said second correlator output signal; and

j. using said time base adjustment signal to synchronize at least one of said periodic timing signal and said timing trigger signal with said received impulse radio signal.

35. The method of claim 34, wherein said received impulse radio signal is flip and shift modulated.

36. The method of claim 35, wherein said received impulse radio signal consists of first type pulses, second type pulses that are substantially the inverse of said first type pulses, delayed first type pulses, and delayed second type pulses that are substantially the inverse of said delayed first type pulses.

37. The method of claim 34, wherein step h. comprises the steps of:

(i) producing, based on said first correlator output signal and said second correlator output signal, a first data state signal corresponding to a first data state, a second data state signal corresponding to a second data state, a third data state signal corresponding to a third data state, and a forth data state signal corresponding to a fourth data state; and

(ii) determining which of said first data state signal, said second data state signal, said third data state signal, and said forth data state signal is greatest.

38. The method of claim 34, wherein step h. comprises:

(i) producing, based on said first correlator output signal and said second correlator output signal, a plurality of first data state signals corresponding to a first data state, a plurality

of second data state signals corresponding to a second data state, a plurality of third data state signals corresponding to a third data state, and a plurality of forth data state signals corresponding to a fourth data state;

(ii) adding said plurality of first data state signals to produce a first data state sum;

(iii) adding said plurality of second data state signals to produce a second data state sum;

(iv) adding said plurality of third data state signals to produce a third data state sum;

(v) adding said plurality of forth data state signals to produce a forth data state sum; and

(vi) determining which of said first data state sum, said second state data state sum, said third data state sum, and said forth data state sum is greatest.

39. The method of claim 34, wherein step i. comprises:

(i) producing, based on said first correlator output signal and said second correlator output signal, a first timing adjustment increment, a second timing adjustment increment, a third timing signal adjustment increment, and forth timing adjustment increment; and

(ii) determining whether said timing adjustment signal should comprise said first timing adjustment increment, said second timing adjustment increment, said third timing adjustment increment, or said forth timing adjustment increment.

40. The method of claim 14, wherein step i. comprises:

(i) producing, based on said first correlator output signal and said second correlator output, a plurality of first timing

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adjustment increments, a plurality of second timing adjustment increments, a plurality of third timing adjustment increments and a plurality of forth timing adjustment increments;

(ii) adding said plurality of first timing adjustment increments to produce a first timing adjustment sum;

(iii) adding said plurality of second timing adjustment increments to produce a second timing adjustment sum;

(iv) adding said plurality of third timing adjustment increments to produce a third timing adjustment sum;

(v) adding said plurality of forth timing adjustment increments to produce a forth timing adjustment sum; and

(vi) determining whether said timing adjustment signal should comprise said first timing adjustment sum, said second timing adjustment sum, said third timing adjustment sum or said forth timing adjustment sum.

41. The method of claim 34, wherein step b. comprises producing said template signal using said timing trigger signal and a code signal, wherein said received signal is coded using a transmit code signal equivalent to said code signal.

42. An impulse radio transmitter, comprising:

a precision timing generator to receive a periodic timing signal and an information signal and to produce at least one of a first signal and a second signal based on said information signal and said periodic timing signal;

a first pulser to receive said first signal and to produce, in response to said first signal, a first impulse radio signal consisting of a first type of impulse waveform;

a second pulser to receive said second signal and to produce, in response to said second signal, a second impulse radio signal consisting of a second type of

impulse waveform, wherein said second type of impulse waveform is substantially an inverse of said first type of impulse waveform; and

a combiner to combine said first impulse radio signal and said second impulse radio signal and thereby produce a flip modulated impulse radio signal.

43. The impulse radio transmitter of claim 42, wherein said precision timing generator produces said first signal and said second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first trigger signal and said second signal comprises a second trigger signal.

44. The impulse radio transmitter of claim 42, wherein said precision timing generator produces said first signal and said second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first enable signal and said second signal comprises a second enable signal.

45. The impulse radio transmitter of claim 44, wherein said precision timing generator also produces a common trigger signal, and said first pulser and said second pulser are adapted to receive said common trigger signal.

46. The impulse radio transmitter of claim 45, wherein:

said first pulser produces said first impulse radio signal in response to receiving both said common trigger signal and said first enable signal, and

said second pulser produces said second impulse radio signal in response to receiving both said common trigger signal and said second enable signal.

47. The impulse radio transmitter of claim 42, wherein said first impulse waveform consists of a negative impulse and wherein said second impulse waveform consists of a positive impulse.

48. The impulse radio transmitter of claim 42, wherein said first impulse waveform corresponds to a first data state and said second impulse waveform corresponds to a second data state.

49. An impulse radio transmitter, comprising:

a precision timing generator to receive a periodic timing signal and an information signal and to produce, based on said information signal and said periodic signal, a first signal, a delayed first signal, a second signal, and a delayed second signal;

a first pulser to produce a first impulse radio signal, in response to said first signal, and a delayed first impulse radio signal, in response to said delayed first signal, wherein said first impulse radio signal and said delayed first impulse radio signal consist of a first type of impulse waveform;

a second pulser to produce a second impulse radio signal, in response to said second signal, and a delayed second impulse radio signal, in response to said delayed second signal, wherein said second impulse radio signal and said delayed second impulse radio signal consist of a second type of impulse waveform, wherein said second type of impulse waveform is substantially an inverse of said first type of impulse waveform; and

a combiner to combine at least one of said first impulse radio signal and said delayed first impulse radio signal with at least one of said second impulse radio signal and said delayed second impulse radio signal, and thereby produce a flip modulated impulse radio signal.

50. The impulse radio transmitter of claim 49, wherein said precision timing generator produces said first signal, said delayed first signal, said second signal and said delayed second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first trigger signal, said delayed first signal comprises a delayed first trigger signal, said second signal comprises a second trigger signal, and said delayed second signal comprises a delayed second trigger signal.

51. The impulse radio transmitter of claim 49, wherein said precision timing generator produces said first signal, said delayed first signal, said second signal and said delayed second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first enable signal, said delayed first signal comprises a delayed first enable signal, said second signal comprises a second enable signal, and said delayed second signal comprises a delayed second enable signal.

52. The impulse radio transmitter of claim 51, wherein said precision timing generator also produces a common trigger signal, and said first pulser and said second pulser are adapted to receive said common trigger signal.

53. The impulse radio transmitter of claim 52, wherein:

said first pulser produces said first impulse radio signal in response to receiving both said common trigger signal and said first enable signal,

said first pulser produces said delayed first impulse radio signal in response to receiving both said common trigger signal and said delayed first enable signal,

said second pulser produces said second impulse radio signal in response to receiving both said common trigger signal and said second enable signal, and

said second pulser produces said delayed second impulse radio signal in response to receiving both said common trigger signal and said delayed second enable signal.

54. The impulse radio transmitter of claim 49, wherein said first impulse waveform consists of a negative impulse and wherein said second impulse waveform consists of a positive impulse.

55. The impulse radio transmitter of claim 49, wherein said first impulse waveform corresponds to a first data state and a second data state, and said second impulse waveform corresponds to a third data state and a forth data state.

56. A method for transmitting impulse radio signals, comprising the steps of:

a. producing a first signal and a second signal using a periodic timing signal and an information signal;

b. producing, in response to said first signal, a first impulse radio signal consisting of a first type of impulse waveform;

c. producing, in response to said second signal, a second impulse radio signal consisting of a second type of impulse waveform, wherein said second type of impulse waveform is substantially an inverse of said first type of impulse waveform; and

d. combining said first impulse radio signal and said second impulse radio signal to thereby produce a flip modulated impulse radio signal.

57. The method according to claim 56, wherein step a. comprises producing said first signal and said second signal using at least said periodic timing signal, said information signal and a code signal, and wherein said first signal comprises a first trigger signal and said second signal comprises a second trigger signal.

58. The method according to claim 57, wherein step a. comprises producing said first signal and said second signal using at least said periodic timing signal, said information signal and a code signal, and wherein said first signal comprises a first enable signal and said second signal comprises a second enable signal.

59. The method according to claim 58, further comprising the step of producing a common trigger signal using at least said periodic timing signal and said information signal, and

wherein step b. comprises producing said first impulse radio signal in response to said first enable signal and said common trigger signal, and

wherein step c. comprises producing said second impulse radio

signal in response to said second enable signal and said common trigger signal.

60. The method according to claim 59, wherein:

said first impulse radio signal is produced in response to reception of both said common trigger signal and said first enable signal, and

said second impulse radio signal is produced in response to reception of both said common trigger signal and said second enable signal.

61. The method according to claim 56, wherein said first type of waveform comprises a negative impulse and said second type of waveform comprises a positive impulse.

62. The method according to claim 56, wherein said first type of impulse waveform corresponds to a first data state and said second type of impulse waveform corresponds to a second data state.

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63. A method of transmitting impulse radio signals, comprising the steps of:

a. producing a first signal, a delayed first signal, a second signal, and a delayed second signal using periodic timing signal and an information signal;

b. producing, in response to said first signal, a first impulse radio signal consisting of a first type of waveform;

c. producing, in response to said delayed first signal, a delayed first impulse radio signal consisting of said first type of waveform;

e. producing, in response to said second signal, a second impulse radio signal consisting of a second type of waveform, wherein said second type of impulse waveform is substantially an inverse of said first type of impulse waveform;

f. producing, in response to said delayed second signal, a delayed second impulse radio signal consisting of said second type of waveform; and

g. combining at least one of said first impulse radio signal and said delayed first impulse radio signal with at least one of said second impulse radio signal and said delayed second impulse radio signal, thereby producing a flip modulated impulse radio signal.

64. The method according to claim 63, wherein step a. comprises producing said first signal, said delayed first signal, said second signal and said delayed second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first trigger signal, said delayed first signal comprises a delayed first trigger signal, said second signal comprises a second trigger signal, and wherein said delayed second signal comprises a delayed second trigger signal.

65. The method according to claim 63, wherein step a. comprises producing said first signal, said delayed first signal, said second signal and said delayed second signal based on at least said information signal and a code signal, and wherein said first signal comprises a first enable signal, said delayed first signal comprises a delayed first enable signal, said second signal comprises a second enable signal, and wherein said delayed second signal comprises a delayed second enable signal.

66. The impulse radio transmitter of claim 65, further comprising the step of producing a common trigger signal using said periodic timing signal and said information signal, and

wherein step b. comprises producing said first impulse radio signal in response to said first enable signal and said common trigger signal,

wherein step c. comprises producing said delayed first impulse radio signal in response to said delayed first enable signal and said common trigger signal,

wherein step d. comprises producing said second impulse radio signal in response to said second enable signal and said common trigger signal, and

wherein step e. comprises producing said delayed second impulse radio signal in response to said delayed second enable signal and said common trigger signal.

67. The method according to claim 66, wherein:

said first impulse radio signal is produced in response to reception of both said common trigger signal and said first enable signal,

said delayed first impulse radio signal is produce in response to reception of both said common trigger signal and said delayed first enable signal,

said second impulse radio signal is produced in response to reception of both said common trigger signal and said second enable signal, and

said delayed second impulse radio signal is produce in response to reception of both said common trigger signal and said delayed second enable signal.

68. The method according to claim 63, wherein said first impulse waveform consists of a negative impulse and wherein said second impulse waveform consists of a positive impulse.

69. The method according to claim 63, wherein said first impulse waveform corresponds to a first data state and a second data state, and said second impulse waveform corresponds to a third data state and a forth data state.

70. A receiver for processing a received impulse radio signal comprising:

an adjustable precision timing generator having a first timing signal output and a second timing signal output;

a first sampler triggered to sample the received impulse radio signal in accordance with said first timing signal output and providing a first sampler output;

a second sampler triggered to sample the received impulse radio signal in accordance with said second timing signal output and providing a second sampler output;

a data detector using at least the first sampler output to produce a data output signal; and

a timing adjuster using at least the second sampler output to produce an adjustment signal that is used to synchronize at least the second sampler with the received impulse radio signal.

71. The impulse radio receiver of claim 70, wherein the received impulse radio signal includes flip modulation, wherein said first sampler output includes said flip modulation, and wherein the said data detector is configured to produce said data output signal using at least said flip modulated first sampler output.

72. The impulse radio receiver of claim 71, further comprising a code source that produces a coding signal, and wherein said adjustable precision timing generator uses the coding signal to add time position coding to the first timing signal and the second timing signal.

73. The impulse radio receiver of claim 72, further comprising a time offset between the first timing signal and the second timing signal, said offset being established such that when synchronization is achieved with the received impulse radio signal, the first sampler samples the received impulse signal at a substantially optimal time to enable said data detector to produce said data output signal.

74. An impulse radio receiver, comprising:

a precision timing generator that triggers a first sampling and a second sampling of a received flip modulated impulse radio signal, said second sampling offset in time from said first sampling;

a data detector that receives at least said first sampling and produces a data signal; and

a time base adjustor that receives at least said second sampling and produces a time base adjustment signal that is used to synchronize at least said first sampling with said received impulse radio signal.

75. The impulse radio receiver of claim 74, wherein said received flip modulated impulse radio signal consists of a first pulse type and a second pulse type that is substantially the inverse of the first pulse type.

76. The impulse radio receiver of claim 75, wherein said first correlator, said second correlator and said data detector perform demodulation of said flip modulated received impulse radio signal.

77. The impulse radio receiver of claim 74, wherein said data detector comprises:

a data path signal selector/inverter that receives said first correlator output signal and outputs a first data state signal corresponding to a first data state and a second data state signal corresponding to a second data state; and

a maximum value selector that determines which of said first data state signal and said second data state signal is greater and produces said data signal based on said determination.